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ABSTRACT

In the mid-1980s, when early electronic newspapers failed to live up to their promise, industry analysts declared them dead as a mass medium. But just 10 years later, "E-papers" are once again receiving much media hype, although little academic research has been done on them. Academic literature, trade articles, online discussions, and personal communications with industry leaders to build a foundation for the academic study of electronic newspapers are reviewed. The emphasis is on basic research that will address industry needs as E-papers reemerge. The following scholarly areas are reviewed with initial research questions formulated for each section: (1) history; (2) network culture; (3) media sociology; (4) management and economics; (5) new media elements; (6) news content features; (7) information processing; (8) commercial messages; (9) ethical and societal concerns; and (10) legal and regulatory issues. Given constraints of length, the paper offers a broad perspective but only a cursory review of an extensive literature. Contains a 153-item list of references in text and a 20-item list of other references regarding electronic newspapers. Two tables of data and a figure are included. (Author/NKA)

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Electronic Newspapers: Toward a Research Agenda

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Abstract

In the mid 1980s, when early electronic newspapers failed to live up to their promise, industry analysts declared them dead as a mass medium. But just 10 years later, "E-papers" are once again receiving much media hype, although little academic research has been done on them. This paper reviews academic literature, trade articles, online discussions, and personal communications with industry leaders to build a foundation for the academic study of electronic newspapers. The emphasis is on basic research that will address industry needs as E-papers reemerge. The following scholarly areas are reviewed with initial research questions formulated for each section:

- History,
- Network Culture,
- Media Sociology,
- Management and Economics,
- New Media Elements,
- News Content Features,
- Information Processing,
- Commercial Messages,
- Ethical and Societal Concerns, and
- Legal and Regulatory Issues.

Given length constraints, this paper offers a broad perspective but only a cursory review of an extensive literature. Bibliographic resources are offered for further reading.

Introduction

In the early 1980s, industry analysts predicted the rise of information services and development of new media would make electronic newspapers the answer to declining penetration rates and increasing costs (Marvin, 1980). By the mid-1980s, the newspaper industry and other media groups had invested over $100 million in online publishing ventures (Pryor, 1994). But by 1986, weak subscription bases led most newspapers to discontinue their efforts. Analysts and publishers agreed it was clear electronic newspapers would not "be a threat to either newspaper advertising or readership in the foreseeable future" (Greenwald, 1990; Hester, 1982).

But in less than 10 years, the electronic newspaper industry has seen a resurgence. Approximately 75 newspapers currently are online, with more coming onboard each day. The increase in all interactive services, from 42 in 1989 up to 2,700 today, has fueled confidence and excitement among newspapers (see Fitzgerald, 1994; Glaberson, 1993, 1994a,b; Haddad, 1993a,b,c,d; Lail, 1994; Markoff, 1993a,b,c,d,e; & McNaughton, 1993a,b,c, among others). Despite this renewed hyping of electronic newspapers, however, experts disagree about the appropriate technology and publishers are trying to discover what content and format will gain audience acceptance. Ken Lewis (1994) suggests, "The net is 5,000 niche markets. There's plenty of room for journalism but very little room for traditional newspaper coverage. Newspapers have evolved to fit paper-based delivery. The net will follow a very different course." But no one has yet ascertained exactly what that different course will be.

In part, what remains unclear is how the new electronic newspapers differ from the earlier failures, how the audience for

these services has changed in the past 10 years, and what their broader social, legal, policy, and ethical implications are. This paper reviews these issues and proposes a wide-ranging research agenda to study electronic newspapers (E-papers).

The History of Electronic Newspapers

Electronic newspapers were made possible through the development of videotex technology in Great Britain in 1974. Videotex merged existing computing and communications systems to allow the interactive transfer of information to be displayed on a home television set (Sigel, 1983a). But videotex was launched on a supply-push market: the technology arose not from the desire to satisfy a consumer need but as a new combination of existing technologies for which consumer needs would have to be manufactured (Schneider et al., 1991).

Most videotex pioneers assumed consumers' primary demand would be for information retrieval services (Meyer, 1988; Paisley, 1983). But in 1981, only two years after the British Broadcasting Corporation launched the first videotex system, they faced losses of over 4 million pounds per quarter (Rogers, 1986; Sigel, 1983b). The BBC's 13,000 subscribers used the information service almost exclusively to pass messages and play games, not for information (IRD Report, 1983; Noll, 1985). Other European countries developed videotex systems, only to have them stagnate over a similar lack of interest in information retrieval (Paillart, 1989; Palmer & Tunstall, 1988).

The most successful European application to date is the French Teletel system, in part because the lack of a regulatory framework allowed the system to develop spontaneously in response to consumer demand (Branscomb, 1988; Charon, 1987; Petrella, 1988). With only 4% of connect time spent on obtaining general news and information, the

French E-papers provide little news but many user services, such as chat boards, e-mail, reservation services, stock market simulations, and polling services (IDATE, 1987).

Videotex development in the United States began in 1978; the first commercial service, The Source, came online in 1979. Although the company president predicted that in six months the service would "be in the home like Tupperware," by 1982 the service had only 20,000 subscribers. Analysis of service use on The Source revealed e-mail was the most popular feature, followed by bulletin boards, then chat lines. News was a distant fifth (Tydeman et al., 1982).

Concurrently, newspapers launched independent electronic publishing efforts in what many viewed as a defensive investment (Mosco, 1982). But Knight-Ridder's Viewtron service and Times Mirror's Gateway both collapsed, with estimated losses of $50 and $30 million, respectively. At the end of a two-year Associated Press trial of 11 prototype E-papers, project directors concluded videotex was a technology in search of a demand, and what that demand might be was far from clear (Hester, 1982).

General information services also were failing during this time. AT&T, Chemical Bank, RCA, Citibank, and NYNEX lost hundreds of millions over failed videotex efforts (Aumente, 1987; Tyson, 1989). Videotex was no longer considered a mass medium but a niche market for special interest groups (Broadcasting, 1988; Noll, 1985). But in the late 1980s the proliferation of home computers persuaded more companies to launch information services, most with user-friendly, menu-driven command screens. Prodigy, GEnie, Delphi, and America On-line joined CompuServe, which in 1989 was considered the industry standard, with 400,000 subscribers and $36.5 million in annual revenue

(Truet & Hermann, 1989). Currently, these five services have over 2.6 million user accounts, with about 5 million total users (Table 1).

The user profile is changing from that of the young, male "electronic innovator" of the 1980s. About 35% of Prodigy users are female, and 12% are over age 55 (Steinberg, 1993). Computer penetration has plateaued at about 33% of households; 13% of U.S. households have modems, although that number is rising as more systems come packaged with modems (see Figure 1; Resnik, 1994a). Because of their market penetration and relative ease of use, newspaper companies are developing working relationships with established services, using the information service infrastructure to support and promote their publishing efforts (Reilly, 1993). Currently, these systems have over 60 papers online (Tables 1 and 2).

Other papers are taking advantage of the reach of the Internet, which originated in 1969 as a U.S. Department of Defense experiment to allow communication among scientists. During the 1980s several other communications systems were linked, and the Internet now comprises networks of academic, military, government, and commercial entities in the United States and 40 other countries (Cooke & Lehrer, 1993; Wagner, 1994). The audience is 20 million users, with one million more coming onboard each month (Anthes, 1993; Elmer-Dewitt, 1993).

History: Research Directions and Questions. Trying to develop a research agenda to study the history of electronic newspapers highlights the problem of trying to capture historical electronic content. Because the media content itself is not available, studies must rely on the few primary materials available, i.e., data from mainly trade articles, beginning with videotex in the 1980s. Somewhat more academic work was done in Europe; tracking and translating these works would provide a better background for researchers here. Combined with archival work and interviews with those involved in the early efforts, the data could address several questions. What market research was conducted? How was it interpreted by decision makers?

How much did the technology drive the content? How much sharing of information occurred, both intranationally and internationally? Was information shared cross-nationally as videotex developed? What role did governments and policy development play in the history of videotex and electronic newspapers?

Network Culture

Many early adopters of electronic newspapers as well as those delivering newspapers online are steeped in the culture of the electronic web, the milieu in which electronic newspapers operate. The norms and rules are so well codified that the CompuServe information service offers novice users instruction in "netiquette" (Compuserve, 1994). Those who violate "netiquette" are subject to harsh attacks, called *flames*. An analysis of this cultural ethos yields the following observations.

Most network users follow the adage "All information wants to be free" (Cooke & Lehrer, 1993) and have an aversion to commercial elements and messages. They see the Internet as a haven from advertisements and commercial aspirations, as the means of building a new and better electronic world (Online, 1994). This world benefits from anonymity, leveling of social power, gender and physical transparency (users are identified by user-name only), and the free sharing of information/assistance. Although some information services are commercially supported, users of these services complain about the intrusion of commercial elements and develop strategies to block them out when they can, or complain about them to the service provider when they cannot (CSAE, 1990). One offense almost guaranteed to bring on flaming is to *spam* a discussion group, i.e., to spread an unsolicited commercial message. Spamming derives from the image of a can of Spam dropping onto a fan, spreading "meat" everywhere.

Members of the net are also suspicious of those who sell newspapers online. Much online discussion questions whether journalists actually add value to information by delivering it in ways we can digest and use (Online, 1994) or whether they serve as unnecessary, perhaps biased, filters (Elmer-Dewitt, 1993). Those who envision the net building a more democratic world see users as information gatherers and sharers who do not want or need a journalist to gather, shape, and disseminate information for them.

Information is made widely available in the Internet culture. Gophers, the World Wide Web (WWW), WAIS (Wide Area Information Server), FAQs (Frequently Asked Questions), News Groups, and Usenets all offer vast and detailed information without charge (Sachs & Stair, 1994; see Levin, 1993, for a glossary of terms). Computer programs called intelligent agents or knowbots, which emulate human intelligence, search resources and retrieve information. These programs can compile information from each day's news to meet personally defined needs (Online, 1994). Combined with the fact that many users have free access to the Internet through work or unlimited access through a nominal monthly fee, the availability of knowbots that can scan wire service copy offers a futuristic but not inconceivable alternative to the newspaper.

Some analysts project the Internet, a non-linear and increasingly multi-media environment, will become predominantly populated with younger users (Online, 1994), which may provide an ideal market for newspapers struggling to attract younger readers. The "youthanizing of the Net" may be exaggerated, but research does suggest younger users prefer computer-driven information delivery (Catlett & Brooks, 1994; Thompson, 1993) and have an affinity for electronic newspapers

they do not have for print counterparts (Brooks & Kropp, 1994; Hammer & Kennedy, 1993).

Network Culture: Research Directions and Questions. *Ethnography and ethnomethodology should be used to obtain the emic meaning of and map the rules governing Network Culture. Do longstanding or confirmed members of net worlds hold different attitudes toward E-papers? How do Netters define value added to information? to commercial messages? Do responses differ for the range of forms of commercial messages (intrusive display ads to product announcements to product forums)? What price/billing structures will the Network Culture accept for electronic newspapers? Will Netters accept a paper with advertising or prefer ad-driven publications to subscription-driven ones? Will Netters accept any billing procedure at all or balk at bills for information services? How will the culture fare in the face of commercial developments?*

Media Sociology

As electronic papers develop, changes may occur in how news content is defined. Some argue that journalists will become mere information providers (IPs) on networks and may lack traditional journalistic ideals (presstime, 1993). As journalists spend more time formatting or processing electronic information, they may have little opportunity to exercise journalistic enterprise (Abernethy, 1991; Hester, 1982). Additionally, electronic papers hire "editors" whose main job is to convert the printed paper to the electronic medium, a mechanical effort derisively termed *shoveling*, with the product known as *shovelware* (Online, 1994; Thalhimer, 1994). Both shoveling and the collection of raw electronic data to be shoveled could diminish active news judgment, decreasing the value of newspaper products and increasing the volume of news. Increasingly, software is being used to automate the shoveling process, compounding these effects.

To some extent news judgment is a consequence of economic constraints. Newshole size is linked to the amount of advertising

available. Electronic newspapers promise greater story length and breadth of coverage because the size of the newspaper is limited only by the energy and time needed to produce it, not by a page limit (Mason, 1993). No longer will finished stories be cut to fit space requirements. News judgment, then, may become a matter of hierarchically arranging unlimited access to stories, rather than a gatekeeping process (Isaacs, 1995).

Many electronic newspapers are providing unedited content to users (Christopher, 1994). E-papers offer not only wire services, but also PR Newswire and Businesswire, news release delivery services. *Access Atlanta*, the electronic counterpart of the *Atlanta Journal/ Constitution*, is considering a service to run unedited news releases of local interest (personal communication, Brian O'Shea, 1994). Traditionally, journalists disdain news releases, although they use them judiciously when information is validated (Berkowitz, 1993; Pincus et al., 1993; Turk, 1988). Offering wire and release services negates the added value derived from journalistic judgment and editing. The trend toward publication of unvalidated material is cause for concern, but it is also in keeping with Network Culture.

The rapid move of electronic newspapers toward multi-media information delivery will require newspaper staff to be proficient in video and audio news processes (Moeller, 1995; Reilly, 1993). Alternatively, newsgathering may be jobbed out to newsgathering syndicates with multi-media skills. Stories would be available digitally for incorporation into electronic newspapers (Tewlow, 1993).

Story notes and data can be stored online and made available to readers. Some members of the Network Culture call for access to reporter's notes to make reporters more accountable, both in story

accuracy and in claims that journalists add value to information through the reporting and editing process. Others claim access to reporter notes and data online will enable fuller coverage and offer readers a more interesting story (Online, 1994).

Interaction with reporters and fellow readers is a highly touted feature of electronic newspapers. But readers with access to story notes may question reporters about their interpretation and selection in creating news stories (Dalton, 1993). This interaction could dampen a reporter's willingness to deal with controversial topics that might generate an overwhelming e-mail response, such as that received by managing editor Jim Gaines of *Time* magazine when the magazine ran the digitally altered photograph of O.J. Simpson on its cover (Wolff, 1994). Even noncontroversial coverage can generate a flow of mail that affects the work schedule. James Coates, a correspondent for *Chicago Online*, spends 4 to 5 hours answering the 250 pieces of e-mail he receives each week as a consequence of including his e-mail address at the end of each column (Moeller, 1994). Some critics contend this interaction with readers will restrain reporters from doing their real work. Instead of gathering news, reporters will be preoccupied with schmoozing the reader, especially when that reader has the upscale demographics not of the average newspaper reader but of the average computer user (Online, 1994; Wolff, 1994).

Others point out that reader-generated information comprises the majority of newspaper content, and directing reporters to respond to their e-mail will simply put them in better touch with their sources (personal communication, Dennis DuBe, Apple e-World, 1994; Wilcox, Ault, & Agee, 1992). Conceivably, the newspaper would be more relevant and contain more local information derived from electronic talk.

Media Sociology: Research Directions and Questions. *Both the current practices of journalists involved with E-papers and the views of journalists about the prospect of working for an online newspaper should be explored. Participant observation, depth interviews, and focus groups could address the following questions. Do journalists perceive electronic newspapers as affecting the values and practice of journalism? How will a potentially unlimited newshole affect news judgment of reporters and editors? Will journalists accept the added workload of responding online to reader messages? How will this interaction affect reporting? How will computer aided research and reporting (CARR) affect news values? Will the converging of reporters from various media into multi-media news syndicators occur? Would such a convergence be healthy for the profession?*

Management and Economic Issues

Determining demand for futuristic products is more difficult than projecting the ability to supply such products (Schneider, et al., 1991): "As a result, efforts have focussed on what is technologically possible rather than what is demonstrably needed" (Curien & Gensollen, 1987, p. 142). The ability to deliver a product does not make that product viable, however. Presumably, electronic newspaper development today is not driven by the panoply of new technologies but by the projected demand for innovative news services (Urban, 1985).

Some argue that research on consumer demand is best done by directly testing the market. Randolph Charles, director of marketing for *Newsday* and *New York Newsday*, calls this "placing many small bets . . . [you] try to get your toe in lots of different pots of water as you move into the new world" (Resnick, 1994a). At the same time, companies are addressing a major objective uncovered in a national survey of the industry: gaining experience with electronic delivery of information (Kelsey, 1993).

Assuming electronic newspapers find a lasting place in the market, media managers face a number of challenges. Many questions

have surfaced concerning staffing (Online, 1994). For an existing newspaper, the number of additional staff needed to go online and their skill levels are still uncertain. Companies must define the status and title to be given to editors who convert news copy from print to online format and to researchers who are more than librarians but often less than reporters (Isaacs, 1995; Leslie, 1994). As electronic newspapers become multimedia services, staffing in online divisions may become more expensive and problematic as tasks shift from "shoveling" print copy to creating a publication that is distinct in look, purpose, and sophistication (Online, 1994).

Media managers wrestle with questions of relative cost, pricing structures, and delivery when comparing printing presses with electronic service (Fidler, 1992; Marvin, 1980; presstime, 1994). If a modern version of videotex emerges as necessary for user satisfaction, the cost of such an information appliance must be covered, either by the individual user or by the information supplier. It remains to be seen how most newspapers will deliver electronic product to subscribers. Electronic delivery contracted with a commercial server provides a pool of potential subscribers, an established marketing program with name recognition, and an established billing system. Some papers, like the *Chicago Tribune*, have bought substantial shares in the commercial services that carry their E-paper, thus increasing the concentration of ownership among the information and media industries (Moeller, 1994).

Alternatives include creation of a local bulletin board service (BBS) or delivery through a World Wide Web server (WWW) on the Internet (Online, 1994; Resnick, 1994a; Rosenberg, 1993). The Internet's appeal to newspaper publishers is partly economic: while

commercial services often get up to 80% or more of connect-time revenue, Internet costs are associated with original equipment and software outlays. With commercial versions of Netscape and Mosaic, web browser programs, navigating the Internet is relatively easy and cheap, even for computer neophytes (Levin, 1993; Markoff, 1993c; Pope, 1994; Strom, 1994). Web browsers now enable highly formatted, multi-media publications to be accessed on the WWW. Currently, 16 newspapers publish electronic editions on the Internet (Table 2), but the availability of Netscape and Mosaic is expected to make that number jump (Andreeson & Bina, 1994; Resnick, 1994a).

Management and Economic Issues: Research Directions and Questions. *Interviews with industry leaders and with media economic analysts are needed to define the dynamic exchange that takes place during production of E-papers. Content analysis of financial papers would help establish which formats and channels of delivery are economically viable and provide a base for the following questions. What do users want and how much will they pay for what they want? Are electronic ventures actually cost-effective methods of gaining experience and market research data? Has proprietary market research been done? Will the Internet serve as a viable alternative to commercial services and local bulletin boards? Will special information appliances be necessary for electronic newspapers to prosper? How will staffing be determined and are managers planning for increased sophistication of electronic staff as online publications evolve? How are managers assessing the relative advantages of commercial services and Internet or local BBS service? Will increasing concentration of ownership of news services with traditional media conglomerates affect the flow and content of news?*

New Media Elements

> Picture this, Doug: You see on your screen what looks a lot like today's newspaper page. You move your mouse to the photo, click, and presto: full motion video and CD quality stereo sound. Now, you move your mouse to the fact box, click, and presto: All the facts. (Carlson, 1994)

Such a multi-media newspaper is not a figment of the future; it is being delivered now by a number of electronic newspapers. The

following characteristics have either been implemented or are projected to arrive in the next several years: moving images, animation, sound, voice recognition, voice generation as text is read to the user, switchable modality from multi-media at home to audio-only while commuting, and an array of interactive elements for navigating the publication (Bender, 1993; Christopher, 1994; Grossberger, 1994; Reilly, 1993).

Currently, the device for delivering these elements is the computer work station. Roger Fidler, director of Knight-Ridder's Information Media Design Laboratory, believes browsing capability and flat panel technology are the keys to audience acceptance, with newspapers better situated to offer multimedia news delivery than the electronic broadcast media (Fidler, 1992; Gilder, 1993; Markoff, 1992; Mason, 1993; Morton, 1993; Newsweek, 1993; presstime, 1993). But Michael Conniff, president of an interactive company and former senior editor of an electronic market service, believes "screenphones" are the only terminal capable of driving the market (Coniff, 1992, 1993a). The key question is whether a single-use machine is viable in the multipurpose computer age (Aumente, 1994).

Others argue that electronic news will be delivered in multi-media format via a smart version of the television, an appliance with a considerable loyal following. Perhaps the most intriguing medium is the thick, paper-like sheet that serves as the touch-screen display conceived by researchers at the MIT Media Lab (Online, 1994). MIT researchers are emulating the physical advantages of print newspapers because "crushed trees smeared with ink" enjoy highly evolved ergonomic virtues, such as size, portability, and flexible searching. The print paper is readily controlled by the reader; as it is scanned,

folded, and clipped, the reader engages in a selective information search based on interest, leisure time, and reading ability.

Researchers at Knight-Ridder's Media Information Laboratory base their format on the paper model of the newspaper because they believe sequentially turned pages provide a "bridge of familiarity" to readers. They argue that button clicking and jumping through the content requires readers to acquire unfamiliar navigation skills rather than making use of the pagination skills they have already acquired (Kleiner, 1994). What most researchers do agree on is the need to make the new multimedium equally flexible for different ages, interests, and reading levels through features like personalized versions or routing the paper based on demographics (Bender, 1993).

The medium will evolve as technology develops. Certain of the multi-media elements may be more appealing and useful than others, and certain elements may conspire with content features to win a place in the market (Urban, 1985). The device that prevails for delivering electronic newspapers will reconcile technology, price, and ergonomic factors. Among the more elusive ergonomic factors, mechanomorphism may emerge as a new, but crucial factor. Mechanomorphism is the tendency by a user to apply the attributes of a medium to the content being delivered by the medium (personal communication, S. A. Shamp, September, 1993). Addressing this phenomenon to the advantage of the medium and the user will be a subtle process, not unlike computer company efforts to cultivate distinct characters and personalities for Macintosh and PC machines.

New Media Elements: Research Directions and Questions. To address many of these new media elements, quasi-experimental methods are needed to determine what users like and regularly use among the array of media elements. Which of these features, if any, are appealing or important to subjects? Which characteristics are most popular with

users? Which would generate loyalty to a newspaper? Will readers acquire new skills as they adopt the new medium, or will the adoption process be more rapid if more familiar skills such as pagination are used? For which demographic groups do these elements matter most? young readers? female readers? In which settings are which elements most valued?

News Content Features of Electronic Newspapers

Three groups of unique content features arise in electronic newspapers: accessibility, customized information, and quality of content. Electronic newspapers serve as gateways to information beyond the copy offered by the paper. One can jump from most electronic papers to electronic versions of the "yellow pages," to chat groups online discussing special topics, to wire and news release services, to home shopping. Access is also available to stories in the newspaper's morgue, related stories on a topic, stories buried in potentially vast electronic back pages, stories in other papers, and to newspaper databases such as clip files, survey data, and reporter's notes (Reilly, 1993). Finally, electronic newspapers offer readers access to reporters and editors through e-mail.

Customized information available through electronic newspapers includes personalized news using programs like NewsClip, Farcast, News Cite, and Journalist (Rosenberg, 1993). Such personalized newspapers are whimsically referred to as the "Daily Me" (Bender, 1993; Conniff, 1993b; Haddad, 1993c; Husted, 1992; Mason, 1993). Other custom features include advertisements tailored to the user's demographics or triggered by previous activity online (see Legal and Regulatory Issues for implications). The more mundane but popular customization is the custom search of classifieds. Users can search precisely through classified ads, save search parameters for subsequent searches, and call up new ads meeting search parameters.

The unique or enhanced content elements in electronic newspapers are wide ranging. Management at *Access Atlanta* believes users want highly localized news such as school menus and Parent Teacher Association newsletters (personal communication, Brian O'Shea, 1994). Given the potentially unlimited newshole, this depth of localization is feasible for online services; given search capabilities, such information can be readily accessed.

Just as the medium enables extensive information for defined audiences, it also offers immediacy. Immediacy is limited only by the constraints on labor to update stories as they unfold (Online, 1994). When Prodigy offered up-to-the-minute poll results during the 1992 elections, it received more incoming traffic than the nationwide system could handle (Prodigy Newsletter, 1992). Sports and financial news are obvious prospects for this news content feature. For example, E-papers could match the immediacy of ESPN or sports radio shows but provide fuller coverage. The resulting hybrid could combine video highlights of unfolding action with details such as box scores that are not available currently until a paper is printed and delivered to the sports fan's home.

As electronic newspapers go through their second manifestation, the ongoing debate about whether newspapers should become a higher class medium or remain a mass medium has come into sharper focus (Bogart, 1993). Arguing that electronic newspapers should be a venue for longer and better-written stories, Katz (1994) calls for better writers to be hired and retained through high compensation and time to write well. An elite audience with time, money and skills to access the paper exists online as a likely market for deeper, better news writing (Franklin, 1992). Anecdotal data indicate many online

subscribers buy an electronic paper for its quality coverage or its top columnists, justifying devotion of greater time and expense to better writing. Given the high socio-economic status of subscribing households and the ability to target commercial messages, electronic newspapers could become more magazine-like in content and in advertiser base than their hard copy counterparts.

Based on the European experience with videotex and competing news sources such as television, print newspapers, news magazines, and radio, some analysts question whether E-paper content will comprise much hard news. Bogart contends most people will use the information highway for entertainment, not knowledge (Freedom Forum, 1993). DuBe describes Apples' e-world as a melding of news content with many other elements, not the least of which is the opportunity to interact with others (personal communication, Dennis DuBe, Apple e-World, 1994). Ironically, this new formula resembles the time-tested one of StartText in Fort Worth, Texas (Online, 1994; Piirto, 1993).

News Content Features: Research Directions and Questions. Use of survey, interview, and computer logs of actual user behavior would determine which of these content elements appeal to research subjects. Are subscribers interested in using newspapers as gateways to more information resources? Which elements diminish in appeal after their novelty wears off? Do subscribers want and use a two-way communication channel with editors and reporters? Would traditional media functions such as surveillance and community building be diminished by news dependence on a "Daily Me" newspaper? What mix of entertainment and news will attract subscribers while allowing the news media to fulfill their primary societal functions?

Information Processing

A number of issues arise concerning how users can and will process information in the new medium. Some of this work is comparative, including an early study comparing videotex with a talking newscaster (Edwardson & McConnell, 1985), and more recent

studies that include print, television, and computer presentation of information (Crigler et al., 1994; Facorro & DeFleur, 1993; Thompson, 1993). One groundbreaking study assesses not just computer presentation, but more specifically, electronic newspaper presentation of information (Brooks & Kropp, 1994).

Unlike experimental work, viewer behavior research takes a more "macro" approach to the viewing process by documenting what people do when viewing. Behaviors such as channel switching, remote muting, conversation, and hobby activity are studied. Some of these data are collected using eye-tracking devices, while other studies use more naturalistic observation (Abernethy, 1991; Anderson et al., 1986; Elton & Carey, 1983; Krugman & Shamp, 1992).

In newspaper research, some analogous work has been done (Bogart & Tolley, 1988; Garcia & Stark, 1991; Rice, 1985; Smith, 1989). With the development of E-papers, which cross media boundaries (see New Media Elements above), far more work needs to be done on how users view/read an electronic newspaper. This new information processing task is called navigation because it involves the processing of icons to travel through screens of electronic territory in the publication (Online, 1994; personal communication, S. A. Shamp, 1994).

Navigation is a learned behavior, somewhat different from reading a paper or watching television. Individual and demographic differences may be important factors in navigational proficiency. The design of the electronic paper will also be critical in how information is processed and what information receives attention (e.g., editorial versus commercial; lead story versus special interest; main news versus database information).

Moving beyond effects on individual users, broader media effects should be explored. For example, navigating an indexed electronic publication may change some theories of media effects, such as agenda setting. Different cues may exist, such as index order or arrangement of icons (Fico et al., 1987), that set news priorities or agendas. Factors in persuasion theory, such as involvement, may need similar reconsideration in this more interactive, merged medium. Differences between print and television effects may be masked or compounded.

Information Processing: Research Directions and Questions. Electronic newspapers lend themselves to a detailed log of user activity (stories and ads viewed, for example). Combined with surveys, experiments, and in-home naturalistic observation, these logs could be used to answer the following questions. Will modality interact with demographic factors such as age, gender, and level of computer anxiety? How will navigational behaviors compare with browsing behaviors of news consumers? Will an online counterpart to zapping occur for electronic advertisements? Will electronic delivery of news affect how that news is perceived? How are memory, attention, information gain, and media preference affected?

Commercial Messages

Although print newspapers continue to be a major component of media plans for advertisers (Nowak et al., 1993; Resnick, 1994b), regional advertisers show little interest in electronic newspapers (Cameron, 1994). Nonetheless, online services are succeeding in attracting advertisers, which suggests electronic newspapers may soon earn advertiser respect. For example, Prodigy claimed 200 advertisers in six industries in 1992 (Target Marketing, 1992).

Electronic newspaper advertising will be just one of many new interactive advertising methods, such as direct mail disks, electronic "junk" mail, kiosks, sponsored games, and interactive home shopping (Breuckner, 1994; Stefanac, 1994b). How great a part of the online mix will be devoted to E-papers depends in part on advertising

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innovation and user behavior. Currently, advertisements intrude on the screen, either in a teaser box at the bottom or as a window taking up part of the screen. Users can select to see the advertisement, which means ads may attract only information seekers and may be copy heavy to meet information needs (Breuckner, 1994). Once an ad is viewed, electronic papers offer the advertiser a marketing advantage by making direct response/ordering features available.

Advertisement inquiries, ordering history, and other database information volunteered or garnered about the user can be used to deliver highly personalized follow-up ads online as well as online direct mail customized to the user's profile (Bender, 1993). Database and integrated marketing can reach remarkable levels through electronic means, levels that broach invasion of privacy (see Legal and Regulatory Issues below).

Two innovations in advertising offer disparate directions for advertising strategy (Laws, 1994). Multi-media advertisements are now possible; display ads may be activated to view full-motion video spots (Breuckner, 1994). In contrast to these compelling ads presented to all users is the concept of commercially sponsored electronic places. Like a McDonalds' playground or a Nike World, analysts envision these sponsored places as enjoyable, informative locations for exposure to and information about products provided by the sponsor and by other users (personal communication, Dennis DuBe, Apple e-World, 1994).

Public relations practitioners can feed news releases onto unedited local wire services as well as to deliver releases directly to the audience through PR Newswire. However, unedited releases may lack the credibility of editorial content (Cameron, 1994a, 1994b; Cameron & Curtin, in press), and it remains to be seen whether users

distinguish between journalistic content and public relations releases in wire service sections of an electronic paper.

Another opportunity for public relations efforts are the forums or discussions among readers and journalists. The opportunity to rebut, praise, critique, or clarify a story will be enhanced by online discussion, although public relations people will probably be accepted as commentators only within limits. The public relations practice of monitoring stories on wires and within public-access databases where reporters make stories in progress available for real-time response (Thomsen, 1994) will be enhanced or hampered, depending on circumstance. Comments and corrections can be made before stories are run and may be made directly to a reporter's electronic mailbox. However, a breaking story could run online as soon as it is finished, dramatically cutting the lag time available for public relations staff to contact a reporter before a story goes to press. Once a story runs, it will experience error inertia as never before as it is electronically clipped and archived by subscribers and by reporters using computerized information gathering techniques (Feola, 1994).

Commercial Messages: Research Directions and Questions. Focus group and survey data could be used to answer the following questions. What factors would enhance the attractiveness of E-papers to media buyers? Will users prefer online commercial space to intrusive advertisements? Will commercially sponsored places inhibit information seeking and contribute to a loss of competitive edge? Experiments could test whether readers distinguish between journalistic content and public relations releases on electronic media. Tracking log files and online archives would provide case study data to answer the following questions. What are the effects of real-time response and is error inertia problematic? Will users tend to activate display ads to obtain the video version of the ad? Will users be information seekers actively clicking on advertisements offered in personalized boxes?

Ethical and Societal Concerns

New communication technologies emerge and are used long before their social impact is known (Cutler, 1990; Smith, 1980). Because they benefit those who are active information seekers, and information seeking corresponds with higher socioeconomic status (CECD, 1982; Cutler, 1990), some analysts are concerned E-papers will contribute to the information gap. The theory that information eventually trickles down to bridge the gap has not been well supported (Talarzyk & Widing, 1990). Taking an inexpensive medium and placing it on high-cost equipment may polarize class lines instead of developing the more democratic society envisioned by Network Culture (Gould, 1989; Husted, 1992; Marvin, 1980; Rogers, 1986). This polarization could extend beyond economic lines to those of technological capability and benefit recognition, requiring that people be trained in technology use and how to apply it profitably to their lives (Christopher, 1994; Freedom Forum, 1993; Willis, 1994). However, early predictions that electronic information media would contribute to the gender gap have not been borne out (Deveze, 1988; Meyer, 1988; Steinberg, 1993).

Some critics predict increased dependence on electronic networks will result in increased human isolation. Less opportunity for social interaction arises as electronic media increasingly are used for "chatting," instruction, shopping, and even telecommuting to work. Ironically, linking to the global net to form a global village may be concomitant with a decay of community and the loss of self in an electronic cocoon (Churbuck & Young, 1992; Dyrli, 1993; Gergen, 1992; Hargadon, 1994; Willis, 1994).

Some analysts believe the prominence of flame attacks and rise of computer sex boards is evidence that the isolated self expresses

itself differently because the anonymity of the net erases the fear of reprisal (Chidley, 1994; De Lacy, 1987; Tempest, 1989; Veyron, 1985). This subject has been more widely studied in France, where 75 sex chat boards in 1987 accounted for 20% of total revenues although they formed only 5% of total service providers (Browning, 1988; Deveze, 1988; Moutet, 1986; Tedesco & Janssen, 1988). The anonymity of the net also creates an atmosphere conducive to the rise of computer crime, with the perpetrators benefitting from free access and almost unlimited range to their victims. Electronic newspaper providers have not been immune to computer virus attacks (Fitzgerald, 1988; Rosenberg, 1993a), and users have fallen prey to scams such as pyramid schemes and credit card theft. With the federal government's proposed Information Superhighway, the continued linking of information networks brings with it the possibility that users will be inviting criminals into their homes every time they read their E-papers.

The sophisticated, interactive advertising and customized consumer information databases available online also raise issues of increased consumer vulnerability to advertising techniques. These techniques may give advertisers an unfair advantage, at least until users develop an awareness of how to use this new technology. Some electronic advertisers have begun paying readers to look at ads, which raises ethical concerns over the legitimacy of this market research technique. Additionally, the use of unedited public relations news releases and the availability of sponsored places raise concerns over whether consumers will be able to distinguish between editorial and commercially sponsored information or if, in fact, a sleeper effect will take place (Cameron, 1994a).

Ethical and Societal Concerns: Research Directions and Questions. *To some extent, the societal and ethical implications of E-paper*

technology will only be known with time. However, interviews and surveys of E-paper providers could determine how they are addressing knowledge gap and stratification issues, if at all. Although the current literature indicates a gender gap does not exist, questions still remain about gendered use of this technology. Focus groups would be useful in determining if gendered differences exists both in use and in perceived application. Determining how the technology affects social interaction patterns is difficult, with longitudinal in-home observation studies the problematic method that might begin to address these concerns. Online surveys could be used to determine the experiences of providers and users with computer crime and what steps they are taking to protect themselves. Experiments could determine how seductive consumers find interactive advertising techniques.

Legal and Regulatory Issues

Debate rages over whether the information highway should be subject to censorship in any form. Because many information services view themselves as more than common carriers, they delete obscenity and personal attacks from public messages. Geoffrey Moore, director of communications for Prodigy, insists "readers have no constitutional right to publish their views in a private medium" (Moore, 1990), whereas America On-line allows interrupts on live chat lines with messages looking for "Hot Housewives" (Ellison, 1991). As noted under Network Culture, most net users believe all information should be readily available, with the notable exception of commercial information, and they complain about any form of censorship (Berman & Rotenberg, 1991; Card, 1991; Lacy 1991; Zachmann, 1990).

The ability of advertisers to gather detailed demographics of users who view their ads and a customized subscriber database is viewed by many Netters as an invasion of privacy, particularly when they receive private e-mail messages from commercial sources. While most readers consider these unnecessary "junk mail," officials praise a marketing channel "very specifically targeted based on member

profiles and usages" (Reynolds, 1990). E-mail is also subject to scrutiny by systems administrators, who of necessity must be able to access the whole system (Willis, 1994). Some analysts have called for laws like those passed in Great Britain and Canada that require anyone keeping a computer record of an individual to send it to that individual for correction (Nelson, 1994).

In general, however, privacy issues in this country have had to rely on technological fixes, rather than regulatory ones, because the status of information systems, as either public forums or common carriers, has never been made clear (Berman & Rotenberg, 1991; Branscomb, 1988; Lundstedt, 1990; Marvin, 1980). The industry itself has delayed pushing for regulation because of fears it would simply freeze new media into historical usage categories, rather than treat them as hybrid technologies (Greenwald, 1990; Martino, 1979). Encryption is the standard technological fix used, and the federal government has recently called for a standardized encryption device called the Clipper Chip to be installed in all communication equipment made in the United States. Critics, however, claim the government will then use the device to spy on citizens, using national security as justification and defeating the original protection of privacy purpose (Nelson, 1994; Willis, 1994).

Encryption also is used to protect electronic copyrights, with intensive lobbying efforts being used to ensure technological control. However, although encryption has become a science, viral attacks that can break encryption codes are proliferating (Mulgan, 1991). And once material is published by an electronic medium, there are few policy guides governing who then owns that information, which can be copied at a speed and on a scale previously unknown (Mulgan, 1991; New York

Times, 1993). With the amount of public information available online increasing exponentially, often what is being copyrighted are search strategies to find and sort public information (Wolf, 1994).

Some analysts have called for the free and open access of the net to be governed by "free and informed consent," although actually enforcing such a policy would appear to be impossible (Gould, 1989). Others argue that "Humans have not inhabited cyberspace long enough or in sufficient diversity to have developed a Social Contract which conforms to the strange new conditions of that world" (Barlow, 1994, p. 88). This view holds that old laws cannot be expanded to cover new technology, which in the case of copyright law means ideas themselves should be subject to copyright protection on electronic media. This approach would require rethinking how information is viewed: rather than using an economic model for information, an ethical one would have to be developed. Again, applying and enforcing such an approach appears problematic at best.

Legal and Regulatory Issues: Research Directions and Questions. *Because policy concerning electronic media has not been established, research efforts must be predicated in part on monitoring court cases and legal developments in this field to track changes in status as they occur. Online surveys could collect reader preferences on type or degree of censorship of public information and what level of advertiser information collection is acceptable. Ethnographic studies could determine how members of the Network Culture balance a free and open information society with their intolerance for commercial information to suggest strategies for achieving a workable balance. Interviews with industry leaders could give direction on ways to rethink the issue of electronic copyright beyond technological fixes and on how to make such schema enforceable.*

Conclusion

The Catch 22 of early electronic newspaper services was that consumers did not want to subscribe if a wide range of services was

not available, but information providers did not want to spend development money on systems that had no subscribers. The linking of electronic newspapers with established information services bypasses this problem, although newspapers establishing themselves on bulletin boards may still be caught in the dilemma. Concern also remains over whether the personal computer remains the best delivery vehicle. Although penetration rates have risen to one-third of all households, indications are the rate is flattening. Conversely, the demographics of these households may be sufficiently attractive to balance out the costs and learning curve associated with introduction of a new device. Additionally, the literature shows that early electronic newspapers failed to attract a sufficient subscriber base in part because they ignored user preferences. The services concentrated on delivering information retrieval, ignoring market research that demonstrated users were more interested in pragmatic communication services (Aumente, 1987; Charon, 1987; Deveze, 1988). But simply asking users what they prefer in an electronic newspaper is problematic because most consumers are unaware of the range of options and how they might use them over time.

Given that electronic newspapers offer advantages that other media lack, academic research conducted in close partnership with industry providers is necessary if this new generation of e-papers is to become a viable medium and live up to its promise. That research must be far ranging, addressing not just issues of appropriate content and technology but the larger concerns of the economic, political, social, and ethical ramifications of the networked world. A variety of methodologies is necessary to answer these concerns, including archival, cross-cultural evaluation and sharing of information, and

in-depth interviews with industry leaders. Ethnographic methods are needed to discover the meaning of the electronic forum for its regular users. Participant observation, in-depth interviews, and focus group methods with industry providers, users, and non-users are needed to establish the issues of direct concern. Survey data can be collected using traditional methods and through online surveys, allowing direct access to motivated users of electronic services. User activity can also be tracked through log files, which contain a complete record of all activities on a service while logged in to it. Experimental methods allow data gathering on new material and concepts that the public may encounter for the first time.

Because both the issues and the research methods are wide ranging, this paper offers only a broad sketch of work to be done. Research must play an initial role in the development of the electronic newspaper and an ongoing role in the monitoring of the many impacts of this new technology. It remains for many scholars to participate in reconciling this electronic medium with the reality that it will change.

Table 1. Online Information Services

Parameter	America Online	Compu-Serve	Delphi	GEnie	Prodigy
No. of Accounts	200,000	1,100,000	>100,000	400,000	870,000
Maximum No. of Users/Account	5	1	5	1	6
No. of Countries Served	1	135	60	30	1
Information Databases	45+	1,200	1	200	none
Encyclopedias	2	2	2	1	1
Magazines	4	200	2	na	12
News Wires/ Sports Services	1	29	3	12	1
Newspapers	2	56	none	na	4

Information compiled from Steinberg (1993) and from the services themselves.

Table 2. Newspapers Available Online.

Carrier	Originating Paper	Online Paper
America Online	Chicago Tribune	Chicago Online
	San Jose (CA) Mercury News	Mercury Center
CompuServe	Akron Beacon Journal	Same*
	Knickerbocker News/ Times Union (Albany, NY)	Same*
	Morning Call (Allentown, PA)	Same*
	Anchorage Daily News	Same*
	Atlanta Constitution/ Atlanta Journal	Same*
	Baltimore Sun	Same*
	Boston Globe	Same*
	Buffalo (NY) News	Same*
	Charlotte (NC) Observer	Same*
	Chicago Tribune	Same*
	Christian Science Monitor	Same*
	Cincinnati Post, Kentucky Post	Same*
	(Cleveland) Plain Dealer	Same*
	(Columbia) State	Same*
	Columbus Dispatch	Same*
	Dayton Daily News	Same*
	Rocky Mountain News (Denver)	Same*
	Detroit Free Press	Free Press Forum
	Financial Times	Same*
	Sun-Sentinel (Fort Lauderdale)	Same*
	Fresno Bee	Same*

* CompuServe carries these papers online unchanged from hard copy.

Table 2 cont.

Carrier	Originating Paper	Online Paper
CompuServe (cont.)	Houston Post	Same*
	Lexington Herald-Leader	Same*
	(London) Independent	Same*
	The Guardian	Guardian
	(London) Times/Sunday Times	Same*
	(Los Angeles) Daily News	Same*
	Los Angeles Times	Same*
	Wisconsin State Journal/ Capital Times	Same*
	(Memphis) Commercial Appeal	Same*
	Miami Herald	Same*
	(Minneapolis) Star Tribune	Same*
	(New Jersey) Record	Same*
	(New Orleans) Times-Picayune	Same*
	New York Newsday/Newsday	Same*
	(Norfolk) Ledger-Star/ Virginian Pilot	Same*
	Orlando Sentinel	Same*
	Palm Beach Post	Same*
	Philadelphia Daily News	Same*
	Philadelphia Inquirer	Same*
	Arizona Business Gazette/ Arizona Republic/ Phoenix Gazette	Same*
	Pittsburgh Post Gazette	Same*
	(Portland) Oregonian	Same*
	Richmond News-Leader/ Richmond Times-Dispatch	Same*

* CompuServe carries these papers online unchanged from hard copy.

Table 2 cont.

Carrier	Originating Paper	Online Paper
CompuServe (cont.)	Sacramento Bee	Same*
	Saint Paul Pioneer Press	Same*
	St. Louis Post-Dispatch	Same*
	St. Petersburg Times	Same*
	San Francisco Chronicle	Same*
	San Francisco Examiner	Same*
	San Jose Mercury News	Same*
	Seattle Post-Intelligencer	Same*
	Seattle Times	Same*
	USA Today	Same*
	The Washington Post	Washington Post
	Washington Times	Same*
	Wichita Eagle	Same*
The Internet	Columbus Dispatch	Columbus Dispatch
	Daily News (Halifax, N.S.)	Daily News Online
	Detroit Free Press	Detroit Free Press
	San Francisco Chronicle/ Examiner	The Gate
	Gazeta Wyborcza, Poland	Gazeta On-line
	O'Reilly Associates	GNN News
	Gazette-Telegraph (Colorado Springs)	GT Online
	L'Unione Sarda (Sardinia, Italy)	L'Unione Sarda Online
	Municipal Reporter (Oslo, Norway)	Kommunal Rapport
	News and Observer (Raleigh, NC)	Nando.Net

* CompuServe carries these papers online unchanged from hard copy.

Table 2 cont.

Carrier	Originating Paper	Online Paper
	Palo Alto News	Palo Alto Weekly
	Norfolk Virginian-Pilot	Pilot Online
	Pittston (PA) Gazette	Pittston Gazette
	San Mateo (CA) Times	San Mateo Times
	St. Petersburg Press (Russia)	St. Petersburg Press
	USA Today	USA Today
Prodigy	Atlanta Journal/Constitution	Access Atlanta
	Los Angeles Times	TimesLink
	Newsday (New York)	Newsday
	Tampa Bay Tribune	Tampa Bay Online

Information compiled from Dalton, 1993, and from the services themselves.

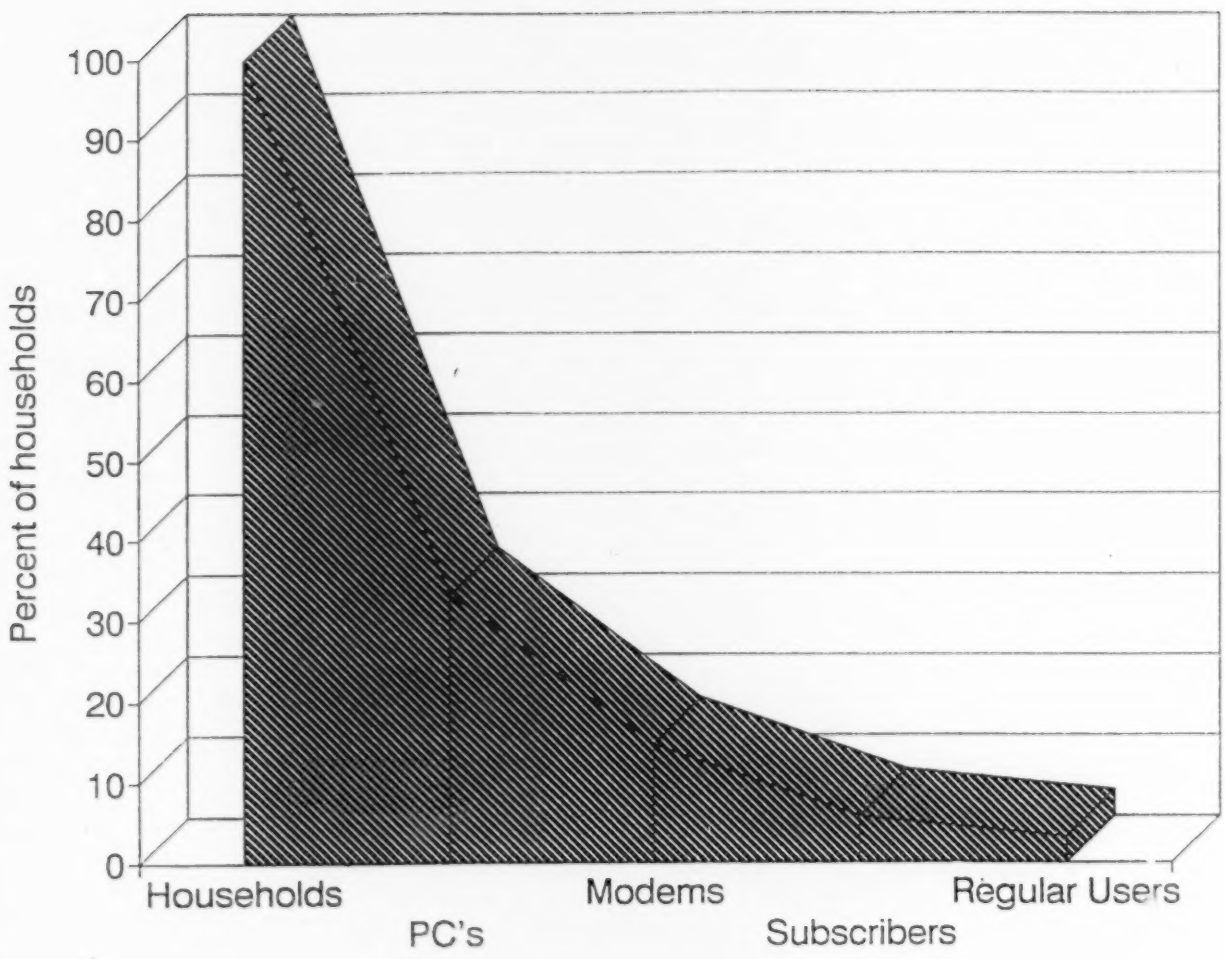

Figure 1. Penetration of Information Services Into the Home

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